

OIL SEALS AND TAPER-ROLLER BEARINGS

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OIL SEALS

1. Before fitting, carefully examine the seal and remove all traces of dirt or grit. This should be done by wiping carefully with a cloth moistened with clean oil.

2. **Leather Seals Impregnated with Wax.** These seals should **not** be soaked in oil prior to fitting as their initial lubrication is provided for during manufacture. Smear the sealing lips with clean grease.

3. **Synthetic Rubber Oil Seals.** These require no preliminary soaking in oil, it being necessary only to smear the sealing lips with clean grease. It is most important when fitting to see that the sealing lip is not damaged, even by the slightest scratch and that the garter spring is correctly located when in position. The seal must be properly pressed home in the housing recess, **with the lip and the garter spring side to face the oil.**

4. Examine the shaft and remove all roughness, burrs on the edges of keyways, screw threads, splines, shoulders, etc., over which the sealing lip is passed. In some cases, where the profile of a shaft over which a seal must pass during fitting is liable to cut the sealing lip, it is good practice to use a fitting sleeve with a lead-on taper and a diameter a few thousandths of an inch greater than the shaft. Where necessary a sheet of shim steel, copper or paper, well greased, should be wrapped around the shaft to cover such sharp edges as might damage the seal.

5. In most cases it will be necessary to press the seal into the housing first and subsequently enter the shaft. In all cases it must be stressed that as far as possible the sealing lips should be observed during fitting to **ensure that the garter spring does not become displaced** during the process. When passing the seal along the shaft, or entering the shaft in the seal, as the case may be, a slight rotary motion will assist the operation. Grease should be applied to the shaft.

6. Do not allow the assembly to rest for any length of time in an incomplete stage of fitting where it might cause the weight of the shaft or housing to be

borne by the seal, resulting in damage or distortion to the latter.

7. Before pressing the seal into the housing the **outside** diameter should be lightly coated with a liquid jointing compound.

8. When pressing a **metal cased** seal into the housing, a firm uniform pressure should be exerted, preferably by means of an arbor press in combination with a suitable tool for a ram. The diameter of the tool should be slightly less than the outside diameter of the seal, e.g. .005"—.015" (.13—.38 mm.) smaller. Only if an arbor press or fitting tool is not available may the following method be adopted. By means of gentle hammer blows applied to an intermediate metal ring, disc or tube of slightly smaller diameter than that of the seal (i.e. .005"—.015" smaller), or other protective piece, drive the seal into place. Care should be taken to apply blows uniformly around the **outside edge** of the seal face, and in no circumstances should the hammer be applied direct to the seal casing. Great care must be taken to see that the seal does not enter the recess in a tilted position.

Note: When pressing metal cased seals into position note that one of the three oil entry holes in the metal face adjacent to the oil must be *upwards* or at "12 o'clock" position so that a small quantity of oil is always retained in the bottom of the metal casing between the other two holes.

9. When pressing in a synthetic rubber type seal (without metal casing), great care is necessary. The leading edge of the recess into which it fits in the housing should be slightly chamfered in order to provide a lead, and the circumference of the seal should also be smeared with oil or grease to avoid cutting its outside diameter during fitting. This type of seal should only be inserted by means of a specially formed tool which is arranged to bear on the flat face of the seal.

Remember that the efficiency of the unit is dependent on the efficiency of the Oil Seal. Therefore treat the latter with care.

TAPER-ROLLER BEARINGS

The bearing assembly consists of two parts, the outer race or cup, and the roller assembly, i.e. roller secured in a cage on the cone or inner race. Usually the cone and roller assembly cannot be separated.

The cups fit in the housing.

The cones fit on the shaft.

1. Cups

- (a) The cups should be an interference fit in their housings. If not, the housings should be replaced.

In no case must knurling, or the application of solder, or the use of liners other than pressed in steel, be resorted to.

- (b) The cups must not be "cocked" when being pressed in, i.e. they must be in line with the bore in the housing throughout the operation of installation.
- (c) The cups must be pressed right home against the abutment shoulder, preferably under a press. It should not be possible to enter a .002" (.051 mm.) thickness gauge between the cup and abutment shoulder. In fitting, use a tool which contacts all round the outer edge. On no account must pressure be applied to the roller track.
- (d) Grease the seating for the cup, which should be assembled clean and smeared with lubricant after installation.

2. Roller Assemblies

Before placing in position, all old grease must be

scrupulously cleaned out and the cages packed between the rollers with new lubricant of the correct grade.

The whole of the roller surfaces should likewise be covered with lubricant.

3. Cones on Stationary Shafts (Stub axles)

- (a) The cones must be a "creep" fit on the shaft, the ideal being .0002"/.0013" (.005/.033 mm.) loose. This permits of easy removal and proper control of adjustment, and allows the cone to alter its axial position slightly when the load is eased momentarily. The seatings for inner race must always be smeared with grease before the bearings are fitted.

- (b) Hub bearings should be adjusted in the manner described in Section F of this manual.

When the correct adjustment has been obtained, lock the nut with a new split pin of correct diameter.

4. Cones on Revolving Shafts (e.g. Pinion Shafts).

The cones should be a press fit, but in some cases where bearing adjustment is made by moving one of the cones, it is not practicable to be more than a light push fit. If cones are loose enough to turn on the rotating shaft, overheating and rapid wear of seating will occur.